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39.   A method for determining forces to be applied to a user through a haptic interface, the method comprising the steps of:

determining a haptic interface location in response to a position of a user;

determining a fiducial object location; and

calculating a force to be applied to the user in response to said haptic interface location and said fiducial object location.

40.   The method of claim 39, wherein the haptic interface is represented by a single point and the fiducial object is represented by a single point.

41.   The method of claim 39, wherein the fiducial object is represented as a three dimensional object.

42.   The method of claim 41, wherein said three dimensional object is approximated by a series of points.

43.   The method of claim 39, wherein said fiducial object is represented as a three dimensional object, said three dimensional object is approximated by a series of points, and the haptic interface location is a single point.

44.   The method of claim 39, wherein the step of determining the fiducial object location comprises the steps of:

generating a representation of a virtual object within a computer; and

computing the fiducial object location, such that the distance between the fiducial object location and the haptic interface location is minimized while maintaining that the fiducial object not pass through the virtual object.

45. The method of claim 44, wherein the geometric representation of the virtual object is generated from a standard computer graphic file format.

46. The method of claim 44, further comprising the step of calculating a reaction force to send to the user, wherein said reaction force depends on a distance between the haptic interface location and the fiducial object location.

47. The method of claim 46, wherein said reaction force is proportional to said distance.

48. The method of claim 46, wherein the step of calculating the reaction force involves calculating a component of said reaction force which depends on a difference in velocity between the haptic interface location and the fiducial object location.

49. The method of claim 48, wherein said component of said reaction force which depends on the difference in velocity between the haptic interface location and the fiducial object location is proportional to said difference in velocity.

50. The method of claim 44, further comprising the step of displaying on a display in a location relative to the virtual object location.

51. The method of claim 50, wherein said fiducial object location is different from said haptic interface location.

52. The method of claim 50, wherein said fiducial object is substantially co-located with said haptic interface location.

53. The method of claim 44, wherein the method is performed iteratively until a valid fiducial object location is found.

54. The method of claim 53, wherein multiple surfaces of at least one virtual object are considered in calculating a valid fiducial object location.

55. The method of claim 44, wherein the virtual object deforms in response to force applied to the virtual object by the user.

56. The method of claim 55, wherein the applied force comprises at least one of a damping force, a stiffness force, and a friction force.

57. The method of claim 55, wherein the applied force comprises at least two of a damping force, a stiffness force, and a friction force.

58. The method of claim 55, wherein the applied force comprises a damping force, a stiffness force, and a friction force.

59. A method for determining forces to be applied to a user through a haptic interface; the method comprising the steps of:

determining a haptic interface location in response to a position of a user;

assigning state variables to the haptic interface location, the state variables adapted to being stored; and

computing forces to be applied to the user based on previously stored state variables of the haptic interface location.

60. A system for determining force to be applied to a user through a haptic interface, the system comprising:

a computation module that determines a haptic interface location in response to a position of a user;

a locating module that determines a fiducial object location; and

a force computation module that calculates a force to be applied to the user in response to the haptic interface location and the fiducial object location.

61.   The system of claim 60, further comprising:

a modeling module that generates a representation of a virtual object within the system; and

a simulation module that computes the fiducial object location such that distance between the fiducial object location and the haptic interface location is minimized while maintaining a condition that the fiducial object not pass through the virtual object.

62.   The system of claim 61, further comprising a display module that displays a representation of the fiducial object on a display in a location relative to the virtual object location.

63.   The system of claim 60, wherein the haptic interface is represented by a single point and the fiducial object is represented by a single point.

64.   The system of claim 60, wherein the fiducial object is represented as a three dimensional object.

65.   The system of claim 64, wherein the three dimensional object is approximated by a series of points.

66.   The system of claim 60, wherein the fiducial object is represented as a three dimensional object, the three dimensional object is approximated by a series of points, and the haptic interface location is a single point.

67.   The system of claim 60, further comprising:

a generation module that generates a representation of a virtual object within a computer; and

a displacement module that computes the fiducial object location such that distance between the fiducial object location and the haptic interface location is minimized while maintaining a condition that the fiducial object not pass through the virtual object.

68.   The system of claim 60, wherein a geometric representation of the virtual object is generated from a standard computer graphic file format.

69.   The system of claim 60, further comprising a module that calculates a reaction force to apply to the user wherein the reaction force depends on distance between the haptic interface location and the fiducial object location.

70.   The system of claim 69, wherein the reaction force is proportional to the distance.

71.   The system of claim 69, wherein the module that calculates the reaction force calculates a component of the reaction force which depends on a difference in velocity between the haptic interface location and the fiducial object location.

72.   The system of claim 71, wherein the component of the reaction force which depends on the difference in velocity between the haptic interface location and the fiducial object location is proportional to the difference in velocity.

73.   The system of claim 60, further comprising a display for displaying on the display in a location relative to the virtual object location.

74.   The system of claim 73, wherein the fiducial object location is different from the haptic interface location.

75.   The system of claim 73, wherein the fiducial object is substantially co-located with the haptic interface location.

76.   The system of claim 60, further comprising a controller module that causes the locating module to iterate until a valid fiducial object location is found.

77.   The system of claim 76, wherein the locating module considers multiple surfaces of one or more virtual objects in calculating a valid fiducial object location.

78.   The system of claim 60, wherein the virtual object is adapted to deform in response to force applied to the virtual object by the user.

79.   The system of claim 78, wherein the applied force comprises at least one of a damping force, a stiffness force, and a friction force.

80.   The system of claim 78, wherein the applied force comprises at least two of a damping force, a stiffness force, and a friction force.

81.   The system of claim 78, wherein the applied force comprises a damping force, a stiffness force, and a friction force.

82. (New)   A method for determining forces to be applied to a user through a haptic interface, said method comprising the steps of:

    (a)   generating a representation of an object in graphic space by defining said object as a mesh of planar surfaces, each of said planar surfaces comprising nodes;

    (b)   sensing a position of a user in real space;

    (c)   determining a haptic interface location in graphic space in response to said position of said user in real space;

    (e)   determining a fiducial object location in graphic space;

    (e)   calculating a stiffness force to be applied to said user in real space in response to said haptic interface location and said fiducial object location in graphic space; and

(f)　　calculating a magnitude of a damping force to be applied to said user in real space in response to said haptic interface location and said fiducial object location in graphic space, further comprising the steps of:

　　　　(i)　　associating a damping coefficient with each of said nodes of each said planar surface;

　　　　(ii)　　determining on which of said planar surfaces said fiducial object is located; and

　　　　(iii)　　computing a damping coefficient of said fiducial object location by interpolating said damping coefficients associated with said nodes of each of said planar surfaces on which said fiducial object is located.

83.　(New)　　A method for determining forces to be applied to a user through a haptic interface, said method comprising the steps of:

(a)　　generating a representation of an object in graphic space by defining said object as a mesh of planar surfaces, each of said planar surfaces comprising nodes;

(b)　　sensing a position of a user in real space;

(c)　　determining a haptic interface location in graphic space in response to said position of said user in real space;

(d)　　determining a fiducial object location in graphic space;

(e)　　calculating a stiffness force to be applied to said user in real space in response to said haptic interface location and said fiducial object location in graphic space; and

(f)　　calculating a direction of a damping force to be applied to said user in real space in response to said haptic interface location and said fiducial object location in graphic space, further comprising the steps of:

　　　　(i)　　associating a surface normal with each of said nodes of each said planar surface;

　　　　(ii)　　determining on which of said planar surfaces said fiducial object is located; and

(iii)   computing a surface normal for said fiducial object location by interpolating said surface normals associated with said nodes of each of said planar surfaces on which said fiducial object is located.